



Electrical system questions? Call us at 425-328-1658!

Greg's Vans 14a
Electrical Load Planning and VP-X Config

27

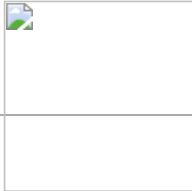
device(s)

61.8A

total current draw

Aircraft Overview - Devices

The following devices represent your aircraft, and will be used to generate your personalized **electrical diagram**, **VP-X pinout** and electrical build **buying guide**.



Instruments/Avionics

GMC 507autopilot

pin name	actual current draw	circuit breaker value	min wire size	VP-X pin	backup?	current fault detect?	switch	bank preference
GMC 507autopilot	0.7A	2.0A	20g	J1-2	none	No	always on	Bank A or B

G5

Garmin G5	0.5A	2.0A	20g	J10-8	none	No	always on	Bank A or B
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GTR-200B radio

GTR-200B radio	0.7A	8.0A	18g	J12-12	none	No	always on	Bank A or B
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Garmin G3X #1

Garmin G3X #1	2.0A	5.0A	20g	J10-7	Method C	Yes	always on	Bank A or B
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Garmin GSU 25

Garmin GSU 25 LRU	0.2A	2.0A	20g	J10-10	Method B	No	always on	Bank A or B
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Garmin GNX-375

375 Nav	3.0A	5.0A	18g	J8-2	none	No	always on	Bank A or B
375 Comm	0.5A	5.0A	18g	J8-1	none	No	always on	Bank A or B

Garmin GAD 29

GAD 29	0.1A	2.0A	20g	J12-7	none	No	always on	Bank A or B
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GEA 24 enginemon

GEA 24 enginemon	0.5A	2.0A	14g	J12-8	Method B	No	always on	Bank A or B
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CO Monitor

CO Monitor	0.1A	1.0A	20g	J1-1	none	No	always on	Bank A or B
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Garmin G3X #2

Garmin G3X #2	2.0A	5.0A	20g	J12-9	Method C	No	always on	Bank A
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AP Servo

AP servo	0.0A	5.0A	20g	J8-5	none	No	always on	Bank A or B
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Lights

Nav lights (LED)

pin name	actual current draw	circuit breaker value	min wire size	VP-X pin	backup?	current fault detect?	switch	bank preference
Nav lights	5.0A	10.0A	18g	J10-3	none	No	Nav Lt	Bank A or B

Landing light #1

Landing Light #1	5.2A	7.0A	18g	J12-1	none	No	Land Lt	Bank A or B
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Landing light #2

Landing light #2	5.2A	7.0A	18g	J12-3	none	No	Land Lt	Bank A or B
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Strobes

Strobes	9.5A	12.0A	14g	J12-2	none	No	Strobe Lt	Bank A or B
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Instrument Lights

Inst Lights	0.5A	2.0A	20g	J8-7	none	No	always on	Bank A or B
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Accessories/Ignition/Other

Pitot heat

pin name	actual current draw	circuit breaker value	min wire size	VP-X pin	backup?	current fault detect?	switch	bank preference
Pitot heat	12.0A	15.0A	14g	J10-6	none	No	Pitot Heat	Bank A or B

Fuel pump

Fuel pump	3.8A	10.0A	18g	J10-5	none	No	Boost Pump	Bank A or B
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UBS outlet

UBS outlet	3.0A	5.0A	20g	J8-3	none	No	always on	Bank A or B
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ELT Battery

ELT Battery	0.0A	5.0A	20g	J8-6	none	No	always on	Bank A or B
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TCW 3/6 AH IBBS

TCW 3/6 AH IBBS	4.0A	5.0A	20g	J10-4	none	No	always on	Bank A or B
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P-Mag #1

P-Mag #1	0.4A	3.0A	20g	J12-10	none	No	always on	Bank A or B
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P-Mag #2

P-Mag #2	0.4A	3.0A	20g	J8-8	none	No	always on	Bank A or B
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Electrical System

Plane Power Pri Alt

pin name	actual current draw	circuit breaker value	min wire size	VP-X pin	backup?	current fault detect?	switch	bank preference
Alternator Field	2.5A	5.0A	20g	J12-11	none	No	Alternator/master	Bank A

notes: This is alternator field power.

VP-X Pinout and Configuration

Currently configuring **VP-X Pro**, 14 volt.

All device pins assigned!

J8

pin	bank	VP-X pin name	power pin name	current draw	wire size	circuit breaker	switch	current fault detect
1	A	5A-1 output	375 Comm	0.5	18	5.0	always on	No
2	A	10A-1 output	375 Nav	3.0	18	5.0	always on	No
3	A	5A-2 output	UBS outlet	3.0	20	5.0	always on	No
4	A	5A-3 output	not assigned					
5	A	5A-4 output	AP servo	0.0	20	5.0	always on	No
6	B	5A-5 output	ELT Battery	0.0	20	5.0	always on	No
7	B	5A-6 output	Inst Lights	0.5	20	2.0	always on	No
8	B	5A-7 output	P-Mag #2	0.4	20	3.0	always on	No

J10

pin	bank	VP-X pin name	power pin name	current draw	wire size	circuit breaker	switch	current fault detect
1	A B	Starter Switch						
2	B	5A-8 output	not assigned					
3	B	10A-2 output	Nav lights	5.0	18	10.0	Nav Lt	No
4	B	5A-9 output	TCW 3/6 AH IBBS	4.0	20	5.0	always on	No
5	B	10A-3 output	Fuel pump	3.8	18	10.0	Boost Pump	No
6	B	15A-1 output	Pitot heat	12.0	14	15.0	Pitot Heat	No
7	B	5A-10 output	Garmin G3X #1	2.0	20	5.0	always on	Yes
8	B	5A-11 output	Garmin G5	0.5	20	2.0	always on	No
9		To GND block						
10	B	5A-12 output	Garmin GSU 25 LRU	0.2	20	2.0	always on	No

J12

pin	bank	VP-X pin name	power pin name	current draw	wire size	circuit breaker	switch	current fault detect
1	A	10A-4 output	Landing Light #1	5.2	18	7.0	Land Lt	No
2	A	15A-2 output	Strobes	9.5	14	12.0	Strobe Lt	No
3	A	10A-5 output	Landing light #2	5.2	18	7.0	Land Lt	No
4		To GND block						
5	B	Flap motor	enabled			5		
6	B	Flap motor	enabled					
7	A	10A-6 output	GAD 29	0.1	20	2.0	always on	No
8	A	5A-13 output	GEA 24 enginemon	0.5	14	2.0	always on	No
9	A	EFIS power output	Garmin G3X #2	2.0	20	5.0	always on	No
10	A	3A-1 output	P-Mag #1	0.4	20	3.0	always on	No
11	A	Alternator Field	Alternator Field	2.5	20	5.0	Alternator/master	

power pin notes: This is alternator field power.

12	A	15A-3 output	GTR-200B radio	0.7	18	8.0	always on	No
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J1

pin	bank	VP-X pin name	power pin name	current draw	wire size	circuit breaker	switch	current fault detect
1	A	2A-1 output	CO Monitor	0.1	20	1.0	always on	No
2	A	2A-2 output	GMC 507autopilot	0.7	20	2.0	always on	No
3		Roll Trim: +2.5v	enabled					
4		Roll Trim: gnd	enabled					
5		Roll Trim: pos input	enabled					
6	A	Roll Trim: motor power	enabled					
7	A	Roll Trim: motor power	enabled					
8		Pitch Trim: +2.5v	enabled					
9		Pitch Trim: gnd	enabled					
10		Pitch Trim: pos input	enabled					
11	A/B	Pitch Trim: motor pwr	enabled					
12	A/B	Pitch Trim: motor pwr	enabled					
17		Flap pos input	enabled					
18		Flap pos gnd	enabled					
19		Flap pos +2.5v	enabled					
20		Serial TX						
21		Serial GND						
22		Serial RX						

J2

pin	bank	VP-X pin name	power pin name	current draw	wire size	circuit breaker	switch	current fault detect
1		External Switch Input 1	Alternator/master					
2		External Switch Input 2						
3		External Switch Input 3	Boost Pump					
4		External Switch Input 4						
5		External Switch Input 5	Nav Lt					
6		External Switch Input 6	Strobe Lt					
7		External Switch Input 7	Land Lt					
8		External Switch Input 8						
9		External Switch Input 9	Pitot Heat					
10		External Switch Input 10						
11		Starter annunciator input	enabled					
12		Aux battery voltage input	enabled					
14		Flap Up switch input	enabled					
15		Flap Down switch input	enabled					
16		Roll Left switch input	enabled					
17		Roll Right switch input	enabled					
18		Pitch Up switch Input	enabled					

19	Pitch Dn switch Input	enabled
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The following device pins also have backup circuits (not show in above diagram):

pin name	backup method	circuit breaker
GEA 24 enginemon	Method B	2.0A
Garmin GSU 25 LRU	Method B	2.0A
Garmin G3X #1	Method C	5.0A
Garmin G3X #2	Method C	5.0A

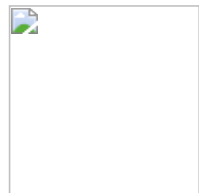
Each column is explained below:

- **Pin:** the actual pin number on the connector.
- **Bank:** The VP-X Pro has two independent systems in one box. Each system is referred to as a "bank" of circuits. This column shows which bank that specific power pin is on. See Installation manual for details on determining which device goes on which bank.
- **VP-X Pin Name:** Describes the function of that pin. 5A-1 for example is a 5 amp circuit and it is the first five amp circuit. 10A-3 is a 10 amp circuit and is the third 10 amp circuit.
- **Power pin name:** You can give each pin a name that shows on the EFIS display.
- **Current draw:** The actual current drawn by a device. It is recommended you measure the ACTUAL current draw of each device prior to installation in the aircraft using an ammeter (commonly available from a friend at no cost or from Radio Shack, Sears, and electronic supply stores for a reasonable one).
- **Wire size:** the wire size you have specified to go between the VP-X and the device being powered.
- **Circuit Breaker:** The maximum current allowed for that pin. You can enter any value between 1 and the limit of that pin in increments of 1A. This value is equivalent to a circuit breaker or fuse. If a load draws more than the Circuit Breaker value, that circuit will fault. If too large of a breaker value is used, then the wire may overheat or fail. If too small a value is used, then the device may fault the circuit because it draws too much current.
- **Switch:** The number of the switch input (switch input 1 through 10) you have specified to control this pin. Or it can be set to 'always on' or 'always off'. Each switch input is labeled 1 through 10. You can assign multiple devices to a single switch, and conversely, a switch can control multiple devices. If you set the circuit to 'always on', it will be on anytime the VP-X is powered (i.e. the master switch is on). Multiple pins can be assigned to a single switch. You don't have to use all of the switch inputs.
- **Current Fault detect:** The pin can be configured to detect a "current fault" or open circuit. When a circuit with this feature enabled is turned on and does not draw any current for 3 seconds, the circuit is faulted. You can use this to detect burned out lights, faulty boost pump, failed avionics fan, or inop heated pitot tube for example. The minimum detectable current is about 100ma, so this should be used on devices like lights, strobes and loads that draw at least 100ma of current.

VP-X Switches

The VP-X allows up to 10 switches, configured to operate any number of connected devices. The following names are suggestions, you can edit this list as required.

The trim and flap switches are wired to their own dedicated pins. The master switch is wired separately from the VP-X and directly to the master contactor. The Starter switch is wired in between the VP-X and the starter contactor. **Do not include trim, flap, master, or starter switches in the items below.** Please see the [VP-X Installation Guide](#) for details.



Your Switches

- **1: Alternator/master**
- **2:**
- **3: Boost Pump**
- **4:**
- **5: Nav Lt**
- **6: Strobe Lt**
- **7: Land Lt**
- **8:**
- **9: Pitot Heat**
- **10:**

Device pins can also be assigned to "always on" or "always off" as required.

VP-X System Settings

VP-X Pro. 32 circuits, 14v or 28v, aux battery monitoring, DualBuss™ technology.

System Voltage: 14

Both systems support primary and backup alternators, two-axis trim controller, and flap controller. *More information is available in the [VP-X Product Description](#)*

Options

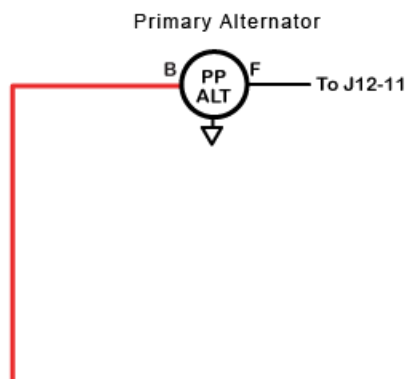
Primary Alternator Internally regulated (Plane Power or similar)
Backup Alternator none

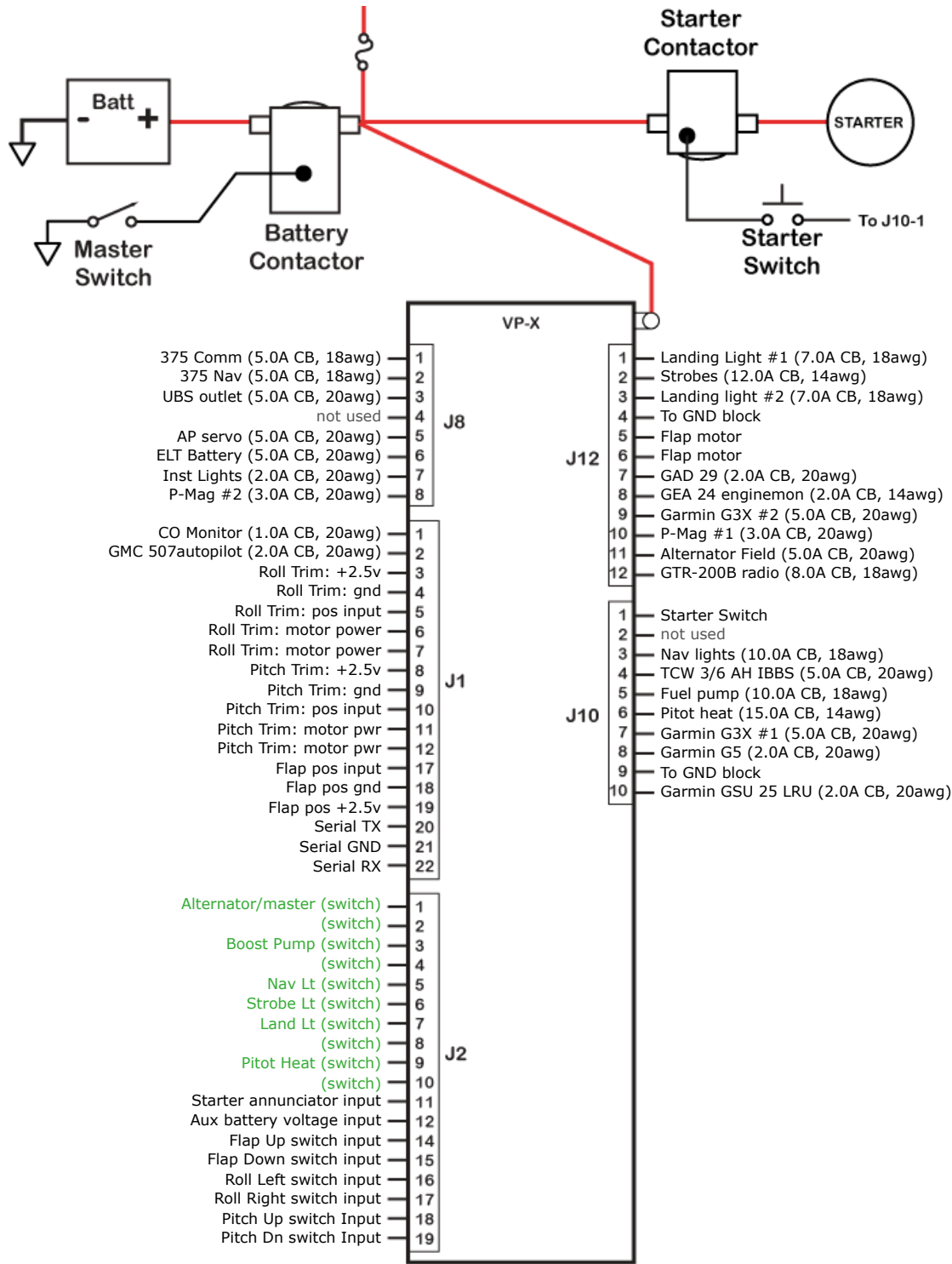
More information on alternators and the options below is available in the [VP-X Installation Guide](#)

Ignition (left side) P-Mag
Ignition (right side) P-Mag

- ☒ Are you installing **electric flaps**?
Flap circuit breaker: 5 amps
- ☒ Are you installing **electric roll trim**?
- ☒ Are you installing **electric pitch trim**?
- ☒ Do you want to **measure voltage on a second or aux battery**? (VP-X Pro only, see installation guide for details)
- ☒ Do you want to use the **starter annunciator feature**?

Electrical Diagram





The following device pins also have backup circuits (not show in above diagram):

pin name	backup method	circuit breaker
GEA 24 enginemon	Method B	2.0A
Garmin GSU 25 LRU	Method B	2.0A
Garmin G3X #1	Method C	5.0A
Garmin G3X #2	Method C	5.0A

Buying Guide

Some suggestion to help you source your electrical system.



Vertical Power

VP-X Pro
VP-X Pro Wiring Harness

EFIS Manufacturers

- [Dynon Avionics](#)
- [Advanced Flight Systems](#)
- [Garmin](#)
- [Grand Rapids Technologies](#)
- [MGL Avionics](#)

Avionics Dealers and Panel Builders

- [Aircraft Spruce](#)
- [Aerotronics](#)
- [SteinAir](#)
- [Stark Avionics](#)

Electrical Supplies

- [Aircraft Spruce](#)
- [Aerotronics](#)
- [SteinAir](#)
- [B&C Specialty Products](#)
- [TerminalTown](#)
- [Van's Aircraft](#)

Alternators

- [B&C Specialty Products](#)
- [Plane Power](#)

Builder Education Resources

- [FAA Hints for Homebuilders](#)
- Aeroelectric Connection book, available from www.aeroelectric.com
- [SportAir workshop](#)
- [Vertical Power documents](#)
- FAA Advisory Circular AC 43.13, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair available from www.faa.gov
- FAA Advisory Circular AC 23.1311, Installation of Electronic Display in Part 23 Airplanes, available from www.faa.gov

Wiring Checklist

Review the following list to be sure you've included everything in your electrical system planning:

- Alternator field
- Backup alternator field
- Starter
- Pitch trim
- Roll trim
- Yaw trim
- Flaps
- EFIS
- Backup EFIS
- Backup battery for EFIS
- Radios/Nav/GPS
- Audio panel/intercom
- Transponder
- Autopilot
- Avionics fan
- Defrost fan
- CO Detector
- XM Weather receiver
- AOA or stall warning
- Manifold pressure sensor
- Engine monitor
- Cabin lights
- Panel lights
- Seat heaters
- Landing light(s)
- Taxi light(s)
- Strobe lights
- Nav lights
- Fuel boost pump
- Electronic ignition
- Hobbs meter

- Music player, DVD, etc.
- Smoke system
- Power outlets
- Headset power
- Microswitches for doors, canopy, etc.

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